

# Motivated belief updating and rationalization of information

Empirical evidence shows that people’s beliefs about personal characteristics or future life outcomes are often too optimistic (see Moore and Healy, 2008, for a review). This optimism bias can result in inferior decision-making and explains a variety of behavioral phenomena in the field such as suboptimal investment decisions (Malmendier and Geoffrey, 2005) and polarization in politics (Ortoleva and Snowberg, 2015). An important question in the economics literature is how these optimistic beliefs evolve despite the presence of objective information because standard economic theory assumes that people process information according to Bayes’ rule.

One behavioral explanation is that people update beliefs about ego-relevant information optimistically, overweighting good news relative to bad news with respect to their preferred state of the world (Eil and Rao, 2011; Möbius et al., 2014; Sharot et al., 2011). Theoretical work in behavioral economics rationalizes this deviation from the Bayesian model using interactions of preferences and beliefs (see Bénabou and Tirole, 2016, for a review). One strand of this literature assumes that beliefs serve not only as a guide for accurate decision making but rather provide hedonic value through motives such as ego utility (Kőszegi and Rabin, 2006), self-esteem (Bénabou and Tirole, 2002) or anticipatory utility (Brunnermeier and Parker, 2005). For instance, Möbius et al. (2014) models optimistic belief updating as an optimal strategy to balance the counteracting forces of instrumental and direct utility from beliefs. One common prediction of these models is that optimistic belief updating is contingent on the direct belief utility that subjects derive from holding inflated beliefs about their abilities and future prospects. As a result, belief updating becomes more optimistic as direct belief utility increases.

In this paper, we test this prediction in a belief updating experiment about relative performance in an IQ test by exogenously varying the direct belief utility that subjects derive from holding inflated beliefs about the preferred state of the world. Specifically, we manipulate subjects’ perceptions about

the ego-relevance of IQ tests. Previous literature in economics tested the optimistic belief updating hypothesis by comparing updating behavior between ego-neutral and ego-relevant events (see Benjamin, 2019; Barron, 2020; Drobner, 2021, for reviews). One key challenge of this methodology is that the events differ in the size and ambiguity of priors, which makes it difficult to disentangle optimistic belief updating from prior related errors in belief updating such as base-rate neglect or confirmation bias (see Barron, 2020, for a discussion). We explicitly address this issue by introducing exogenous variation in subjects' perceived ego-relevance in a single event and after the prior belief elicitation. To this end, our methodology provide a clean test of the optimistic belief updating hypothesis.

In our laboratory experiment, subjects perform an IQ test and we elicit beliefs about the probability to score in the top half of the performance distribution. After the elicitation of initial beliefs, we manipulate subjects' perceived ego-relevance of the IQ test by providing polarizing information about the importance of IQ tests. In the *High Ego* treatment, subjects receive an article with scientific evidence in favor of IQ tests as predictor for intelligence and future productivity. In the *Low Ego* treatment, subjects receive an article with scientific evidence against the validity of IQ tests as a measure for intelligence. Subsequently, we provide subjects with two binary signals and elicit posterior beliefs. In line with Drobner (2021), we explicitly inform subjects that the true state of the world remains uncertain to ensure that there is a scope for motivated reasoning. Finally, we elicit subjects' perceived ego-relevance of the IQ test to provide a sanity check for our treatment manipulation. This experimental methodology allows us to compare updating behavior to the normative benchmark of Bayes' rule and estimate the causal effect of ego-relevance on belief updating behavior.

Overall, the results show that subjects in the *High-Ego* update their beliefs more optimistic than subjects in the *Low-Ego* treatment. First, we document more optimistic final beliefs in the *High-Ego* treatment compared to the *Low-Ego* treatment. Second, we use a structural empirical framework and find that subjects in the *High-Ego* treatment update more in response too good

signals than bad signals about their relative performance, while there is no such optimistic updating in the *Low-Ego* treatment. To this end, our results provide strong evidence for an ego driven updating process, confirming a key prediction of models with belief-based utility (Möbius et al., 2014; Bénabou and Tirole, 2002).

Moreover, we document that subjects manipulate their stated beliefs about the ego-relevance of the IQ test depending on the valence of signals, which is an additional channel for subjects to protect direct belief utility (Drobner, 2021). Controlling for IQ test scores, subjects perceive the IQ test as being less ego-relevant and they indicate less effort in the IQ test as the number of bad signals increases. Taken together, the results suggest that subjects use two alternative strategies to maximize their direct belief utility. On the one hand side, subjects update their beliefs in response to objective information optimistically. On the other hand, they manipulate the extent to which beliefs enter the utility function directly.

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